Chemical & Engineering NE

Enoxy—corporate interview with new European chemical power
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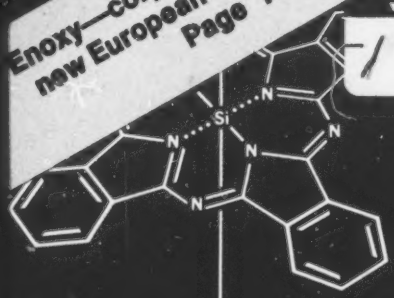

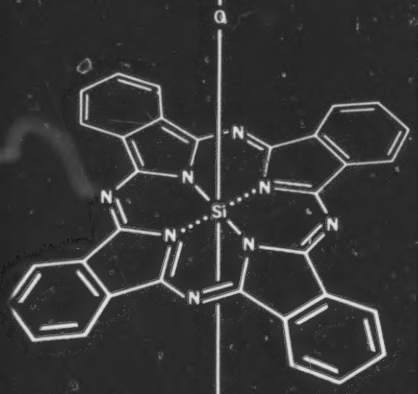

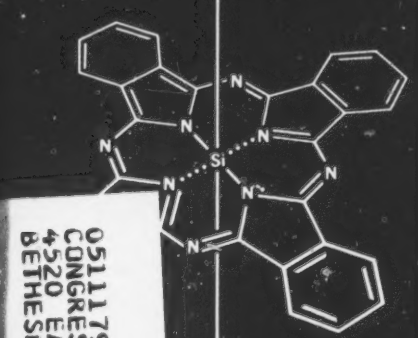

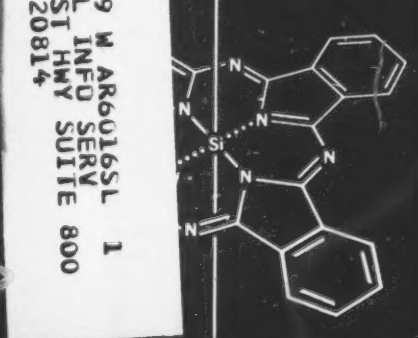

Conducting polymers

One of fast-emerging fields covered by ACS meeting symposia
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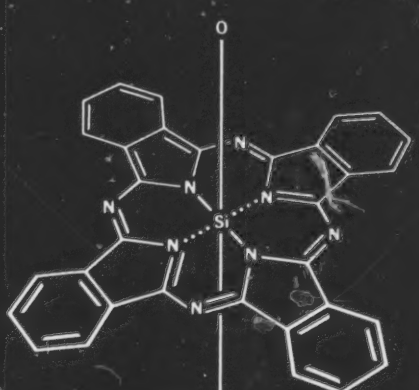

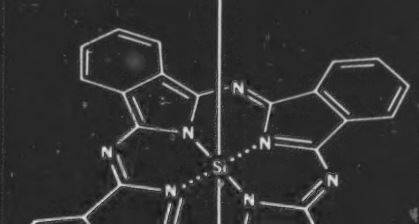

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News of the Week

- ***Environmental Protection Agency*** *will require operators of waste disposal sites to carry liability insurance.* ***Page 6***
- ***EPA's proposed changes*** *to clean water law provoke environmental groups.* ***Page 6***
- ***Conference calls for efforts*** *to alleviate engineering faculty shortage.* ***Page 7***
- ***Reorganization*** *of National Research Council is almost complete.* ***Page 7***
- ***Use of monoclonal antibodies*** *in a diagnostic test device approved by FDA.* ***Page 8***
- ***Ronald Frankum*** *named deputy to Presidential Science Adviser.* ***Page 8***

Business

- ***Adhesives maker H. B. Fuller*** *anticipates $1 billion sales by 1987.* ***Page 15***

International

- ***Enoxy*** *acquires U.K. synthetic rubber company in first step toward becoming a multinational chemical firm.* ***Page 18***
- ***New UN system*** *for financing scientific development in developing countries described at Las Vegas symposium.* ***Page 19***

Government

- ***Toxic substances law*** *has not lived up to its potential, speakers at I&EC symposium conclude.* ***Page 23***
- ***Economics of controlling acid rain*** *subject of session sponsored by Division of Environmental Chemistry.* ***Page 24***
- ***Changes must be made*** *in the nation's food safety laws, say participants in Chemical information Division symposium.* ***Page 25***

Science

- ***Research results*** *on topics from artificial photosynthesis to bioavailability of zinc reported at Las Vegas meeting.* ***Page 29***

Education

- ***Computer games*** *such as "Nuclear Casino" take the drudgery out of drill work for students mastering chemistry basics.* ***Page 55***

Books

- ***"Metric Madness"*** *by J. W. Batchelder attacks the switch to metric as costly and unnecessary.* ***Page 57***

ACS News

- ***Council approves $4.00 dues increase*** *and acts on petitions at a four-hour session in Las Vegas.* ***Page 60***
- ***University of North Carolina, Chapel Hill, regains its status*** *as top producer of B.S. and Ph.D. chemistry graduates.* ***Page 63***
- ***ACS Committee on Professional Training 1981 annual report*** *shows B.S. chemistry graduates increased almost 3%.* ***Page 64***

Chapel Hill again tops new graduate list

The University of North Carolina, Chapel Hill, and the University of Illinois, Urbana-Champaign, have regained their status as the nation's largest producers of B.S. and Ph.D. chemistry graduates, respectively, according to data gleaned by C&EN from the latest annual report of ACS's Committee on Professional Training (CPT).

This committee is the mechanism by which ACS both sets standards for undergraduate education in chemistry and monitors such programs at more than 500 schools. The committee does not set standards or monitor graduate chemistry programs, but it does gather data on them. It also gathers data on chemical engineering programs. (The full text of the committee's latest report covering the 1980–81 academic year starts on page 64).

In 1979–80 Indiana University dislodged Chapel Hill from a six-year reign as the largest producer of B.S. chemists. But in the 1980–81 report, Chapel Hill surges back to the top with a total of 156 such graduates, and Indiana slips to second with 132. The University of California, Los Angeles, moves up from seventh to take third place with a total of 126 B.S. graduates.

Similarly, a six-year reign by Urbana-Champaign as the largest producer of Ph.D. chemists was interrupted in 1979–80 by the University of California, Berkeley. In the latest report Urbana-Champaign is firmly back on top with 73 new Ph.D. chemists; Berkeley slips to second with 45. Purdue takes third place with 39 Ph.D. graduates.

For the seventh consecutive year the University of California, San Diego, is the largest producer of certified B.S. chemistry graduates. Such graduates have completed a curriculum certified by CPT and are eligible immediately for ACS membership.

In the latest report Yale University retains its status as the largest producer of M.S. chemists with 41 such graduates, well ahead of Cornell University and Harvard University that share second place with 27 each.

Texas A&M leads in production of new B.S. chemical engineers with 166 such graduates in 1980–81. And Massachusetts Institute of Technology is the largest producer of graduate chemical engineers with 63 at the M.S. level and 15 at the Ph.D. level.

Michael Heylin, Washington

These schools had the most chemistry graduates, 1980–81

Total B.S. graduates

1. U of North Carolina, Chapel Hill	156
2. Indiana U	132
3. U of California, Los Angeles	126
4. U of Pittsburgh	103
5. Emory U	102
6. U of Illinois, Urbana-Champaign	94
7. U of South Florida	93
8. Duke U	90
9. Rutgers U, New Brunswick	85
10. U of Miami	81
11. Miami U	80
12. U of Florida	79
13. U of California, San Diego	78
14. U of Maryland	77
15. U of Washington	73
16. U of Colorado, Boulder	69
17. U of Michigan, Ann Arbor	67
18. U of Virginia	63
19. State U of New York, Stony Brook	59
20. U of Puerto Rico, Rio Pedras	57
21. U of California, Berkeley	55
22. Case Western Reserve U	54
22. U of Georgia	54
24. Creighton U	53
25. U of Texas, Austin	52
25. Valparaiso U	52
25. West Virginia U	52

Certified B.S. graduates

1. U of California, San Diego	78
2. U of Michigan, Ann Arbor	67
3. Rutgers U, New Brunswick	63
4. U of Pittsburgh	57
5. U of California, Berkeley	54
6. U of Texas, Austin	52
6. U of Washington	52
8. U of North Carolina, Chapel Hill	49
9. Massachusetts Inst. of Tech	47
10. U of California, Los Angeles	39
10. Cornell U	39
12. U of Cincinnati	38
13. U of Colorado, Boulder	37
14. Carnegie-Mellon U	36
14. U of Illinois, Urbana-Champaign	36
14. Rensselaer Polytechnic Inst.	36
17. Lehigh U	35
18. Illinois State U	31
18. Texas A&M	31
20. U.S. Naval Academy	30
21. Indiana U	29
22. Boston C	28
22. U of South Florida	28
22. State U of New York, Albany	28
25. Northwestern U	27
25. U of Puerto Rico, Mayaguez	27

M.S. graduates

1. Yale U	41
2. Cornell U	27
2. Harvard U	27
4. Columbia U	23
5. U of Michigan, Ann Arbor	21
5. Purdue U	21
7. U of California, Berkeley	20
7. U of Illinois, Urbana-Champaign	20
9. Ohio State U	19
10. U of Cincinnati	18
11. Johns Hopkins U	17
11. Northwestern U	17
13. U of California, Los Angeles	16
13. Morehouse C[a]	16
15. U of Pittsburgh	15
16. U of California, San Diego	14
16. U of Illinois, Chicago Circle	14
16. North Texas State U	14
16. Seton Hall U	14
16. Texas A&M U	14
16. Wayne State U	14
22. New York U	13
22. Princeton U	13
22. Rutgers U, Newark C of Arts & Sci	13
22. U of Texas, Dallas	13
22. U of Wisconsin, Madison	13

Ph.D. graduates

1. U of Illinois, Urbana-Champaign	73
2. U of California, Berkeley	45
3. Purdue U	39
4. California Inst. of Tech	36
4. Massachusetts Inst. of Tech	36
6. Ohio State U	31
7. U of California, San Diego	30
7. Indiana U	30
9. U of Wisconsin, Madison	28
10. U of North Carolina, Chapel Hill	27
11. Iowa State U of Science & Tech	26
11. Michigan State U	26
13. Northwestern U	25
14. U of California, Davis	24
14. Cornell U	24
14. U of Southern California	24
17. Pennsylvania State U	23
18. U of California, Los Angeles	22
18. Columbia U	22
20. U of Nebraska, Lincoln	21
20. U of Washington	21
22. Texas A&M U	20
22. U of Texas, Austin	20
24. U of Georgia	19
24. U of Pittsburgh	19

a Master's degrees given by Atlanta U.

ACS Committee on Professional Training 1981 annual report

The number of bachelor's degree graduates in chemistry from schools whose undergraduate chemistry programs are approved by ACS increased almost 3% in 1980–81 from the previous year, back approximately to the number of graduates in 1979. The number of master's degrees from these departments again decreased, this year 5%, and the number of Ph.D. degrees continued to rise for the second year in a row, this year 3%.

The percentage of baccalaureate graduates certified to ACS continued at the 41% level. (Certified graduates are those who have completed the curriculum specified by CPT and are eligible for full membership in ACS; noncertified graduates may become associate members of ACS upon graduation and full members after three years of professional experience or a higher degree in a chemical science.)

Total numbers of bachelor's degrees (certified and noncertified), master's degrees, and Ph.D. degrees awarded in 1980–81 by departments whose chemistry programs are ACS approved are listed by institution in the large table at the end of this report and are summarized in the two smaller tables. These tables also include numbers of chemical engineering graduates from institutions whose programs are accredited by the American Institute of Chemical Engineers and the Accreditation Board for Engineering & Technology. (Note: These departments are not required to report their data to CPT, so the number of departments included in this listing varies from year to year.)

The number of bachelor's degrees in chemical engineering from the 110 AIChE-ABET-accredited departments that reported in 1981 increased 9% from the total reported by 109 departments in 1980. These 110 departments reported an expected further increase of 11% in 1982. During the five-year period from 1977 to 1981, the number of reported bachelor's degree graduates in chemical engineering increased 78%. At the graduate level, the number of chemical engineering master's degrees reported in 1981 rose 5% from the year before, and the number of Ph.D. degrees reported rose 3%.

Programs at ACS-approved departments normally are re-evaluated at five-year intervals. There were 559 colleges and universities on the approved list at the end of 1981. The committee studied the chemistry programs at 150 of them during the year. Each re-evaluation involved a review of extensive documentary materials submitted by the department head describing the current status of the program. During 1981, four chemistry programs were newly approved by the committee, four approved programs were put on probation, four were removed from probation, and two were removed from the approved list.

The committee continued during the year its work in revising the criteria used to evaluate undergraduate programs in chemistry. A very suc-

Summary of data from approved programs, 1977–81

	Bachelors				Masters		Doctorates	
	Number of schools	Graduates (total)	Certified graduates	Non-certified graduates	Number of schools	Graduates	Number of schools	Graduates
CHEMISTRY								
1977	534	10,207	4219	5988	321	1688	189	1563
1978	547	10,350	4285	6065	323	1798	189	1532
1979	551	10,451	4424	6027	323	1716	188	1532
1980	554	10,170	4170	6000	324	1698	188	1561
1981	558	10,453	4337	6116	323	1609	187	1613
CHEMICAL ENGINEERING[a]								
1977	120	—	3282	—	115	1095	103	298
1978	119	—	4225	—	114	1109	98	251
1979	112	—	4977	—	107	951	92	237
1980	109	—	5348	—	105	974	88	243
1981	110	—	5831	—	106	1020	87	250

a Chemical engineering departments are not required to report their data to CPT, so the number of departments included in this category varies from year to year. **Note:** Bachelor's degree projections for 1982: 558 chemistry departments report that they expect a total of 9509 bachelor graduates with majors in chemistry during the 1981–82 academic year, and 110 chemical engineering departments report that they expect a total of 6472 bachelor graduates with majors in chemical engineering.

Summary of totals from 1981 reports from approved programs

	Schools reporting	Men	Women	Total
CHEMISTRY				
Bachelors, total	558			10,453
Certified		3114	1223	4,337
Noncertified		4311	1805	6,116
Masters	323	1158	451	1,609
Doctorates	187	1358	255	1,613
CHEMICAL ENGINEERING				
Bachelors, certified	110	4644	1187	5,831
Masters	106	888	132	1,020
Doctorates	87	239	11	250

Committee members, 1981

J. Arthur Campbell, *chairman*
Harvey Mudd College
Henry A. Bent, *acting chairman, September to December 1981*
North Carolina State University
Alice J. Cunningham
Agnes Scott College
Ernest L. Eliel
University of North Carolina, Chapel Hill
Patricia A. M. Figueras
Eastman Kodak Research Labs
Harry B. Gray
California Institute of Technology
C. David Gutsche
Washington University
Donald E. Jones
Western Maryland College
Peter Lykos
Illinois Institute of Technology
Eli M. Pearce
Polytechnic Institute of New York
Melvin B. Robin
Bell Telephone Laboratories
Jere P. Segrest
University of Alabama, Birmingham
Harry S. Mosher, *consultant*
Stanford University
Bonnie R. Blaser, *secretary*
Nancy B. Jackson, *staff associate, January to July 1981*
Mairin B. Brennan, *staff associate, July to December 1981*
American Chemical Society

cessful meeting at which representatives of the ACS divisions were invited to discuss their suggestions for the revision was held at the ACS national meeting in Atlanta in March 1981, and an open meeting to which representatives of all ACS-approved departments and other interested members were invited was held at the ACS national meeting in New York City in August. Plans for 1982 include sending a draft copy of the revision to all ACS-approved departments, ACS divisions, and committee Visiting Associates prior to the committee's open meeting in Las Vegas in March.

On July 1, the committee, with the concurrence of the ACS Board of Directors, withdrew from membership in the Council on Postsecondary Accreditation (see C&EN, July 13, 1981, page 23, for more detailed information on this subject.) Prior to that action, the ACS-approved schools were surveyed concerning their thoughts on the proposed withdrawal, and during the three weeks within which responses were to be sent to the committee, 453 (81%) of the 560 approved schools responded. Of these, 419 (92%) agreed that CPT should withdraw from COPA membership.

The 1981 edition of the biennial ACS Directory of Graduate Research was published in October and included for the first time those departments at the master's degree level whose undergraduate programs are ACS approved and which require a master's thesis. The number of pages in this edition of the directory increased 16% (as opposed to 11% increases for the three preceding editions), the number of departments listed increased 22% (to 647), the number of faculty members 13% (to 10,775), and the number of research publication citations 12% (to 54,412). The average number of research publications per faculty member changed from 5.14 in the 1979 edition to 5.05 in the current volume.

Funding was obtained by the committee for constructing a Subject Index for the Chemical Sciences: a proposed, compact, computerized data base of the names and research interests of faculty members included in the Directory of Graduate Research, beginning with the 1983 edition. The data base will be arranged in a hierarchical way so that it can be searched to yield information on faculty members who have expressed interest in any broad subject, or, on a reduced scope, to identify those with interests in exceedingly narrow disciplines. Because the data base will be built on faculty lists in the directory, it will serve as a multilevel concordance for this volume.

To determine why chemistry faculty members leave for other positions, especially nonacademic ones, the committee conducted a survey in 1980 on faculty mobility in the past 10 years (1970–79) in the ACS-approved departments. A report of this study was published in C&EN, Feb. 16, 1981, page 28. To identify trends, a followup survey was completed for the 1980 calendar year. A report on the results of this survey and comparisons with the previous study will be published in 1982.

The committee also conducted surveys in 1981 on the use of computers in undergraduate chemistry programs and on the language requirements in graduate programs in chemistry. Reports on these also will be prepared and published in 1982.

Chemistry and chemical engineering degrees awarded by approved schools, 1980–81

	CHEMISTRY				CHEMICAL ENGINEERING		
	Bachelor's, certified						
	Yes	No	M.S.	Ph.D.	B.S.	M.S.	Ph.D.
Abilene Christian U	11	3	1	—	—	—	—
Adelphi U	1	5	5	—	—	—	—
Agnes Scott C	5	2	—	—	—	—	—
Akron, U of	10	5	8	5	(a)	—	—
Alabama, U of							
University	5	17	2	3	30	6	0
Birmingham	4	23	3	2	—	—	—
Huntsville	3	2	4	—	—	—	—
Alaska, U of	3	1	0	—	—	—	—
Albion C	2	16	—	—	—	—	—
Albright C	6	18	—	—	—	—	—
Alfred U	7	0	—	—	—	—	—
Allegheny C	4	27	—	—	—	—	—
Alma C	1	9	—	—	—	—	—
American U	3	0	6	7	—	—	—
Amherst C	8	4	—	—	—	—	—
Andrews U	6	6	—	—	—	—	—
Appalachian State U	7	10	0	—	—	—	—
Arizona State U	24	14	3	9	42	3	0
Arizona, U of	16	17	11	9	35	6	0
Arkansas, U of							
Fayetteville	7	23	1	9	53	5	0
Little Rock	3	5	0	—	—	—	—
Ashland C	1	3	—	—	—	—	—
Auburn U	9	33	3	4	60	7	0
Augsburg C	3	8	—	—	—	—	—
Augustana C (Illinois)	1	11	—	—	—	—	—
Augustana C (South Dakota)	0	7	—	—	—	—	—
Austin C	2	8	—	—	—	—	—
Baldwin-Wallace C	2	10	—	—	—	—	—
Ball State U	13	1	5	—	—	—	—
Barnard C	0	15	—	—	—	—	—
Bates C	10	6	—	—	—	—	—
Baylor U	13	20	0	1	—	—	—
Beloit C	0	7	—	—	—	—	—
Bemidji State U	1	6	—	—	—	—	—
Birmingham-Southern C	2	16	—	—	—	—	—
Bloomsburg State C	1	2	—	—	—	—	—
Boston C	28	6	4	4	—	—	—
Boston U	5	24	3	4	—	—	—
Bowdoin C	5	31	—	—	—	—	—
Bowling Green State U	6	19	9	—	—	—	—
Bradley U	3	9	4	—	—	—	—
Brandeis U	0	27	9	5	—	—	—
Bridgeport, U of	7	1	1	—	—	—	—
Bridgewater State C	1	11	3	—	—	—	—
Brigham Young U	26	13	4	2	34	9	5
Brown U	4	36	0	12	—	—	—
Bryn Mawr C	14	0	1	1	—	—	—
Bucknell U	10	13	0	—	35	1	—
Butler U	2	12	4	—	—	—	—
California Institute of Tech	5	12	2	36	16	8	7
California Polytechnic State U	13	21	5	—	—	—	—
California State C							
Bakersfield	3	0	—	—	—	—	—
San Bernardino	1	6	—	—	—	—	—
Stanislaus	5	3	—	—	—	—	—
California State Polytechnic U	10	2	6	—	(e)	—	—
California State U							
Chico	1	8	—	—	—	—	—
Dominguez Hills	4	6	—	—	—	—	—
Fresno	1	5	4	—	—	—	—
Fullerton	15	21	4	—	—	—	—
Hayward	14	14	4	—	—	—	—
Long Beach	9	30	7	—	31	—	—
Los Angeles	19	0	5	—	—	—	—
Northridge	9	7	4	—	—	—	—
Sacramento	7	13	2	—	—	—	—

	CHEMISTRY				CHEMICAL ENGINEERING		
	Bachelor's, certified						
	Yes	No	M.S.	Ph.D.	B.S.	M.S.	Ph.D.
California, U of							
Berkeley	54	1	20	45	102	19	12
Davis	19	6	10	24	45	10	2
Irvine	10	36	6	11	—	—	—
Los Angeles	39	87	16	22	—	—	—
Riverside	5	2	7	9	—	—	—
San Diego	78	0	14	30	—	—	—
Santa Barbara	19	5	9	14	24	11	3
Santa Cruz	9	12	5	6	—	—	—
Calvin C	7	3	—	—	—	—	—
Canisius C	7	0	—	—	—	—	—
Capital U	2	8	—	—	—	—	—
Carleton C	2	27	—	—	—	—	—
Carnegie-Mellon U	36	3	5	6	64	21	7
Carroll C	5	11	—	—	—	—	—
Carthage C	3	4	—	—	—	—	—
Case Western Reserve U	11	43	7	4	50	16	1
Catholic U of America	3	1	3	2	12	1	0
Centenary C of Louisiana	1	4	—	—	—	—	—
Central C	0	6	—	—	—	—	—
Central Connecticut State C	13	2	1	—	—	—	—
Central Florida, U of	11	0	2	—	—	—	—
Central Michigan U	2	23	2	—	—	—	—
Central State U							
Wilberforce, Ohio	6	2	—	—	—	—	—
Edmond, Okla.	1	16	—	—	—	—	—
Charleston, C of	7	3	—	—	—	—	—
Chatham C	1	2	—	—	—	—	—
Chestnut Hill C[b]							
Chicago, U of	11	15	5	15	—	—	—
Cincinnati, U of	38	0	18	18	79	17	2
Citadel, The	3	10	—	—	—	—	—
City U of New York—							
Graduate Center				13			
Brooklyn C	1	49	0	—	—	—	—
City C	0	22	2	—	(a)	—	—
Herbert H. Lehman C	5	1	—	—	—	—	—
Hunter C	3	0	0	—	—	—	—
Queens C	8	14	1	—	—	—	—
Clarion State C	3	3	—	—	—	—	—
Clark U	12	0	0	3	—	—	—
Clarkson C of Tech	14	0	7	2	95	14	2
Clemson U	8	2	3	4	53	2	2
Cleveland State U	17	0	10	3	33	5	0
Coe C	0	8	—	—	—	—	—
Colby C	4	8	—	—	—	—	—
Colgate U	1	7	—	—	—	—	—
Colorado C	9	8	—	—	—	—	—
Colorado School of Mines	3	0	11	3	71	10	8
Colorado State U	17	11	5	17	—	—	—
Colorado, U of							
Boulder	37	32	12	16	71	12	1
Denver	3	8	2	—	—	—	—
Columbia U	7	39	23	22	(a)	—	—
Concordia C	2	9	—	—	—	—	—
Connecticut, U of	11	24	7	4	55	16	5
Cooper Union[c]					25	5	—
Cornell C	0	15	—	—	—	—	—
Cornell U	39	0	27	24	62	12	1
Creighton U	2	51	3	—	—	—	—
Dartmouth C	0	21	5	3	—	—	—
David Lipscomb C	2	11	—	—	—	—	—
Davidson C	9	1	—	—	—	—	—
Dayton, U of	7	4	3	—	40	8	—
Delaware State C	0	1	—	—	—	—	—
Delaware, U of	26	21	7	5	57	13	7
Delaware Valley C of Science & Agriculture	2	2	—	—	—	—	—
Delta State U	3	10	0	—	—	—	—
Denison U	0	11	—	—	—	—	—
Denver, U of	4	5	3	1	—	—	—
De Paul U	1	2	2	—	—	—	—
DePauw U	3	5	—	—	—	—	—
Detroit, U of	5	4	3	3	(a)	—	—
Dickinson C	3	17	—	—	—	—	—
Drake U	2	3	1	—	—	—	—
Drew U	2	7	—	—	—	—	—
Drexel U	15	4	7	4	81	10	1
Duke U	16	74	1	15	—	—	—
Duquesne U	5	4	12	2	—	—	—
Earlham C	1	13	—	—	—	—	—
East Carolina U	5	7	4	—	—	—	—
East Stroudsburg State C	4	19	2	—	—	—	—
East Tennessee State U	3	6	0	—	—	—	—
East Texas State U	5	2	3	—	—	—	—
Eastern Illinois U	11	3	2	—	—	—	—
Eastern Kentucky U	4	8	2	—	—	—	—
Eastern Michigan U	1	20	12	—	—	—	—
Elizabethtown C	1	15	—	—	—	—	—
Elmhurst C	4	13	—	—	—	—	—
Emory U	7	95	12	10	—	—	—
Emporia State U	5	3	2	—	—	—	—
Evansville, U of	3	9	—	—	—	—	—
Fairfield U	11	13	—	—	—	—	—
Fairleigh Dickinson U							
Rutherford	1	1	3	—	—	—	—
Teaneck	19	1	2	—	—	—	—
Fisk U	13	0	3	—	—	—	—
Florida Atlantic U	4	19	2	0	—	—	—
Florida State U	4	30	7	12	—	—	—
Florida, U of	6	73	3	12	51	6	3
Fordham U	7	14	0	4	—	—	—
Fort Lewis C	1	9	—	—	—	—	—
Franklin and Marshall C	15	6	—	—	—	—	—
Furman U	10	12	2	—	—	—	—
Geneva C	4	4	—	—	—	—	—
George Mason U	14	11	—	—	—	—	—
George Washington U	5	8	3	0	—	—	—
Georgetown U	19	0	9	9	—	—	—
Georgia Institute of Tech	15	0	9	9	137	19	1
Georgia State U	3	8	2	—	—	—	—
Georgia, U of	3	51	12	19	—	—	—
Gettysburg C	9	9	—	—	—	—	—
Glassboro State C	5	2	—	—	—	—	—
Gonzaga U	1	3	—	—	—	—	—
Goucher C	1	11	—	—	—	—	—
Grand Valley State C	1	6	—	—	—	—	—
Grinnell C	2	15	—	—	—	—	—
Gustavus Adolphus C	8	16	—	—	—	—	—
Hamilton C	0	11	—	—	—	—	—
Hamline U	4	5	—	—	—	—	—
Hampden-Sydney C	11	2	—	—	—	—	—
Hampton Institute	1	3	—	—	—	—	—
Hartford, U of	7	2	0	—	—	—	—
Hartwick C	3	1	—	—	—	—	—
Harvard U	0	26	27	17	—	—	—
Harvey Mudd C	16	0	—	—	—	—	—
Haverford C	15	5	—	—	—	—	—
Hawaii, U of	14	4	3	8	—	—	—
Hiram C	2	12	—	—	—	—	—
Hobart and William Smith C	1	15	—	—	—	—	—
Hofstra U	10	4	—	—	—	—	—
Hollins C	0	0	—	—	—	—	—
Holy Cross, C of the	25	15	1	—	—	—	—
Hope C	13	24	—	—	—	—	—
Houston, U of	14	3	1	7	29	12	7
Howard U	1	36	6	8	23	—	—
Humboldt State U	5	3	—	—	—	—	—
Idaho State U	0	6	1	—	—	—	—
Idaho, U of	6	2	7	3	18	7	1
Illinois Benedictine C	10	0	—	—	—	—	—
Illinois Institute of Tech	5	0	2	2	(a)	—	—
Illinois State U	31	2	9	—	—	—	—
Illinois, U of							
Chicago Circle	22	29	14	9	(a)	—	—
Urbana-Champaign	36	58	20	73	94	16	10
Illinois Wesleyan U	0	5	—	—	—	—	—
Indiana State U	2	2	3	—	—	—	—
Indiana U	29	103	9	30	—	—	—
Indiana U of Pennsylvania	12	2	4	—	—	—	—
Indiana U, South Bend	2	7	—	—	—	—	—
Indiana U-Purdue U							
Fort Wayne	2	4	—	—	—	—	—
Indianapolis	2	24	4	—	—	—	—

	CHEMISTRY				CHEMICAL ENGINEERING		
	Bachelor's, certified						
	Yes	No	M.S.	Ph.D.	B.S.	M.S.	Ph.D.
Iowa State U of Science & Tech	7	7	7	26	75	10	2
Iowa, U of	9	3	9	6	20	2	2
Ithaca C	5	3	—	—	—	—	—
Jackson State U	2	4	6	—	—	—	—
James Madison U	4	15	—	—	—	—	—
John Carroll U	4	20	2	—	—	—	—
Johns Hopkins U	17	0	17	12	—	—	—
Juniata C	7	20	—	—	—	—	—
Kalamazoo C	3	17	—	—	—	—	—
Kansas State U	3	4	5	6	25	6	3
Kansas, U of	12	23	2	7	37	7	3
Kearney State C	1	2	—	—	—	—	—
Kent State U	10	12	2	4	—	—	—
Kentucky, U of	11	14	5	4	47	13	2
Kenyon C	8	5	—	—	—	—	—
King's C	5	0	—	—	—	—	—
Knox C	6	20	—	—	—	—	—
Lafayette C	1	13	—	—	46	—	—
Lake Forest C	0	3	—	—	—	—	—
Lamar U	15	3	1	—	33	11	0
La Salle C	7	2	—	—	—	—	—
Lawrence U	1	9	11	4	—	—	—
Lebanon Valley C	10	2	—	—	—	—	—
Lehigh U	35	0	12	6	96	18	4
Le Moyne C	16	0	—	—	—	—	—
Lincoln U	0	7	—	—	—	—	—
Long Island U							
Conolly C	3	7	6	—	—	—	—
C. W. Post C	6	2	—	—	—	—	—
Loras C	4	9	—	—	—	—	—
Louisiana State U							
Baton Rouge	5	5	2	6	76	11	6
Shreveport	4	0	—	—	—	—	—
Louisiana Tech U	0	4	1	—	22	2	—
Louisville U of	5	18	1	2	—	25	1
Lowell, U of	6	0	6	2	28	1	—
Loyola C	13	0	—	—	—	—	—
Loyola Marymount U	3	1	—	—	—	—	—
Loyola U	0	0	—	—	—	—	—
Loyola U of Chicago	16	19	5	1	—	—	—
Luther C	1	9	—	—	—	—	—
Macalester C	1	12	—	—	—	—	—
MacMurray C	1	5	—	—	—	—	—
Maine, U of	3	4	4	0	48	4	0
Manhattan C[d]	16	7	—	—	60	36	—
Manhattanville C	3	1	—	—	—	—	—
Mankato State U	2	9	2	—	—	—	—
Marietta C	7	1	—	—	—	—	—
Marist C	4	3	—	—	—	—	—
Marquette U	13	0	5	2	—	—	—
Marshall U	2	12	4	—	—	—	—
Maryland, U of	8	69	4	7	66	7	2
Maryland Baltimore County, U of	5	7	0	0	—	—	—
Massachusetts Institute of Tech	47	0	1	36	117	63	15
Massachusetts, U of	20	6	9	13	46	8	1
McMurry C	1	6	—	—	—	—	—
McNeese State U	1	0	0	—	—	—	—
Memphis State U	1	15	2	1	—	—	—
Merrimack C	10	0	—	—	—	—	—
Metropolitan State C	17	11	—	—	—	—	—
Miami U	19	61	6	4	—	—	—
Miami, U of	8	73	1	2	—	—	—
Michigan State U	24	17	7	26	81	13	2
Michigan Tech U	8	0	3	1	88	2	—
Michigan, U of							
Ann Arbor	67	0	21	18	111	10	5
Dearborn	10	8	—	—	—	—	—
Flint	1	8	—	—	—	—	—
Middle Tennessee State U	2	27	3	—	—	—	—
Middlebury C	1	8	0	—	—	—	—
Midwestern State U	6	4	—	—	—	—	—
Millersville State C	3	4	—	—	—	—	—
Millsaps C	6	20	—	—	—	—	—

	CHEMISTRY				CHEMICAL ENGINEERING		
	Bachelor's, certified						
	Yes	No	M.S.	Ph.D.	B.S.	M.S.	Ph.D.
Minnesota, U of							
Minneapolis	26	0	6	15	(a)	—	—
Duluth	11	12	2	—	—	—	—
Mississippi C	0	12	—	—	—	—	—
Mississippi State U	1	6	4	0	44	3	0
Mississippi, U of	2	39	1	1	13	2	0
Missouri, U of							
Columbia	10	13	6	1	65	16	0
Kansas City	6	22	0	1	—	—	—
Rolla	9	2	8	4	98	14	2
St. Louis	11	13	3	2	—	—	—
Monmouth C	0	6	—	—	—	—	—
Montana C of Mineral Science & Tech	1	2	0	—	—	—	—
Montana State U	2	7	2	1	52	3	0
Montana, U of	3	9	4	0	—	—	—
Montclair State C	9	14	6	—	—	—	—
Moorhead State U	1	1	—	—	—	—	—
Moravian C	2	3	—	—	—	—	—
Morehouse C[e]	0	4	16	—	—	—	—
Morgan State U	1	7	—	—	—	—	—
Mount Holyoke C	0	11	1	0	—	—	—
Mount Saint Vincent, C of[d]	1	1	—	—	—	—	—
Muhlenberg C	3	18	—	—	—	—	—
Murray State U	3	14	3	—	—	—	—
Muskingum C	0	17	—	—	—	—	—
Nebraska, U of							
Lincoln	6	7	3	21	32	8	0
Omaha	3	7	—	—	—	—	—
Nebraska Wesleyan U	4	1	—	—	—	—	—
Nevada, U of							
Las Vegas	3	9	—	—	—	—	—
Reno	0	3	1	1	—	—	—
New Hampshire, U of	6	5	2	7	31	5	1
New Jersey Institute of Tech[c]					96	23	3
New Mexico Highlands U	0	1	0	—	—	—	—
New Mexico Institute of Mining & Tech	2	3	2	—	—	—	—
New Mexico State U	5	9	1	4	30	4	—
New Mexico, U of	9	2	12	9	(a)	—	—
New Orleans, U of	1	8	0	8	—	—	—
New York U	18	14	13	6	—	—	—
North Alabama, U of	11	1	—	—	—	—	—
North Carolina A&T State U	6	1	2	—	—	—	—
North Carolina Central U	0	6	2	—	—	—	—
North Carolina State U	10	5	0	3	(a)	—	—
North Carolina, U of							
Asheville	2	3	—	—	—	—	—
Chapel Hill	49	107	6	27	—	—	—
Charlotte	5	12	4	—	—	—	—
Greensboro	9	7	5	—	—	—	—
Wilmington	7	6	—	—	—	—	—
North Dakota State U	0	10	4	2	—	—	—
North Dakota, U of	3	6	3	5	24	4	—
North Texas State U	0	16	14	10	—	—	—
Northeast Louisiana U	2	0	1	—	—	—	—
Northeastern U	10	1	7	9	(a)	—	—
Northern Arizona U	3	39	2	—	—	—	—
Northern Colorado, U of	4	6	3	—	—	—	—
Northern Illinois U	13	12	5	0	—	—	—
Northern Iowa, U of	3	12	4	—	—	—	—
Northern Michigan U	3	8	0	—	—	—	—
Northwest Missouri State U	3	2	—	—	—	—	—
Northwestern State U of Louisiana	0	0	0	—	—	—	—
Northwestern U	27	21	17	25	62	19	5
Norwich U	3	0	—	—	—	—	—
Notre Dame, U of	10	14	5	5	66	9	3
Oakland U	12	18	2	—	—	—	—
Oberlin C	1	18	—	—	—	—	—
Occidental C	4	14	—	—	—	—	—
Ohio Northern U	0	7	—	—	—	—	—
Ohio State U	26	0	19	31	63	15	2
Ohio U	9	13	2	3	21	3	—
Ohio Wesleyan U	1	11	—	—	—	—	—
Oklahoma State U	8	13	0	5	52	13	2
Oklahoma, U of	8	23	11	5	51	9	7

	CHEMISTRY				CHEMICAL ENGINEERING		
	Bachelor's, certified						
	Yes	No	M.S.	Ph.D.	B.S.	M.S.	Ph.D.
Old Dominion U	5	8	9	—	—	—	—
Oregon State U	10	0	7	16	52	9	2
Oregon, U of	7	19	4	6	—	—	—
Pace U	2	3	—	—	—	—	—
Pacific Lutheran U	0	15	—	—	—	—	—
Pacific, U of The	2	25	0	1	—	—	—
Pennsylvania State U	24	25	10	23	145	9	4
Pennsylvania, U of	6	26	0	18	38	10	7
Philadelphia C of Pharmacy & Science	9	0	3	0	—	—	—
Philadelphia C of Textiles & Science	7	5	—	—	—	—	—
Pittsburg State U	2	6	1	—	—	—	—
Pittsburgh, U of	57	46	15	19	95	12	6
Polytechnic Institute of New York	7	0	7	8	33	10	2
Pomona C	4	5	—	—	—	—	—
Portland State U	5	8	2	0	—	—	—
Pratt U[c]					14	—	—
Princeton U	24	2	13	16	35	3	7
Providence C	2	2	0	0	—	—	—
Puerto Rico, U of							
Mayaguez	27	3	6	—	78	1	—
Rio Piedras	14	43	2	4	—	—	—
Puget Sound, U of	4	7	1	—	—	—	—
Purdue U	25	15	21	39	133	19	10
Purdue U, Calumet	0	0	—	—	—	—	—
Randolph-Macon Woman's C	2	3	—	—	—	—	—
Redlands, U of	3	0	—	—	—	—	—
Reed C	17	2	—	—	—	—	—
Regis C	0	3	—	—	—	—	—
Rensselaer Polytechnic Institute	36	0	7	8	117	15	1
Rhode Island, U of	5	8	5	1	20	7	2
Rice U	11	3	1	4	(a)	—	—
Richmond, U of	2	22	0	—	—	—	—
Rider C	9	0	—	—	—	—	—
Ripon C	4	3	—	—	—	—	—
Roanoke C	4	4	—	—	—	—	—
Rochester Institute of Tech	6	0	3	—	—	—	—
Rochester, U of	7	12	8	10	37	4	1
Rollins C	1	0	—	—	—	—	—
Roosevelt U	7	1	5	—	—	—	—
Rose-Hulman Institute of Tech	5	0	—	—	72	0	—
Russell Sage C	7	1	—	—	—	—	—
Rutgers U							
New Brunswick	63	22	10	8	(a)	—	—
Newark C of Arts & Sciences	19	13	13	6	—	—	—
Saginaw Valley State C	6	9	—	—	—	—	—
St. Anselm's C	2	4	—	—	—	—	—
St. Cloud State U	3	6	—	—	—	—	—
St. John Fisher C	13	2	—	—	—	—	—
St. John's U	6	2	5	1	—	—	—
St. Joseph C	0	1	8	—	—	—	—
St. Joseph's U	9	16	8	—	—	—	—
St. Lawrence U	10	18	—	—	—	—	—
St. Louis U	2	40	3	—	—	—	—
St. Mary's C	0	9	—	—	—	—	—
St. Olaf C	6	36	—	—	—	—	—
St. Peter's C	2	5	—	—	—	—	—
St. Thomas, C of	6	6	—	—	—	—	—
Sam Houston State U	7	1	6	—	—	—	—
San Diego State U	20	0	10	2	—	—	—
San Francisco State U	7	37	7	—	—	—	—
San Francisco, U of	3	3	5	—	—	—	—
San Jose State U	20	15	10	—	19	9	—
Santa Clara, U of	10	6	—	—	—	—	—
Scranton, U of	5	26	11	—	—	—	—
Seattle U	1	3	—	—	—	—	—
Seton Hall U	11	3	14	8	—	—	—
Shippensburg State C	7	5	0	—	—	—	—
Siena C	7	1	—	—	—	—	—
Simmons C	4	3	—	—	—	—	—
Skidmore C	2	9	—	—	—	—	—
Slippery Rock State C	6	1	—	—	—	—	—
Smith C	5	1	0	1	—	—	—
Sonoma State U	0	7	—	—	—	—	—
South Carolina, U of	8	22	5	15	33	2	0
South Dakota School of Mines & Tech	5	0	1	—	36	2	—
South Dakota State U	1	29	3	—	—	—	—
South Dakota, U of	8	13	1	—	—	—	—
South Florida, U of	28	65	3	1	(a)	—	—
Southeast Missouri State U	1	7	3	—	—	—	—
Southeastern Massachusetts U	10	4	1	—	—	—	—
Southern California, U of	13	9	3	24	(a)	—	—
Southern Illinois U							
Carbondale	4	17	6	4	—	—	—
Edwardsville	8	15	7	—	—	—	—
Southern Methodist U	8	13	0	—	—	—	—
Southern Mississippi, U of	7	6	3	1	—	—	—
Southern Oregon State C	2	2	—	—	—	—	—
Southern U and A&M C	7	0	2	—	—	—	—
Southwest Missouri State U	2	21	—	—	—	—	—
Southwest State U	4	6	—	—	—	—	—
Southwest Texas U	5	0	3	—	—	—	—
Southwestern at Memphis	10	6	—	—	—	—	—
Southwestern Louisiana, U of	1	17	1	—	14	2	—
Southwestern Oklahoma State U	10	13	—	—	—	—	—
Stanford U	17	10	0	17	19	14	7
State U of New York							
Albany	28	3	6	4	—	—	—
Binghamton	10	33	6	2	—	—	—
Buffalo	14	13	3	11	100	7	7
Stony Brook	24	35	5	7	—	—	—
C at Brockport	3	8	—	—	—	—	—
C at Buffalo	16	1	2	—	—	—	—
C at Cortland	4	6	—	—	—	—	—
C at Fredonia	5	10	2	—	—	—	—
C at Geneseo	3	2	1	—	—	—	—
C at New Paltz	10	1	3	—	—	—	—
C at Oneonta	1	20	2	—	—	—	—
C at Oswego	13	2	3	—	—	—	—
C at Plattsburgh	6	17	3	—	—	—	—
C at Potsdam	7	13	—	—	—	—	—
Stephen F. Austin State U	2	6	2	—	—	—	—
Stetson U	2	6	—	—	—	—	—
Stevens Institute of Tech	6	5	10	3	—	—	—
Suffolk U	2	0	—	—	—	—	—
Susquehanna U	4	1	—	—	—	—	—
Swarthmore C	2	8	—	—	—	—	—
Syracuse U	11	6	3	3	(a)	—	—
Temple U	11	11	4	4	—	—	—
Tennessee Tech U	5	14	1	—	24	1	0
Tennessee, U of							
Knoxville	8	12	4	11	79	12	5
Chattanooga	14	25	—	—	—	—	—
Martin	1	7	—	—	—	—	—
Texas A&I U	6	1	2	—	28	8	—
Texas A&M U	31	6	14	20	166	10	0
Texas Christian U	1	8	0	4	—	—	—
Texas Southern U	21	0	4	—	—	—	—
Texas Tech U	18	16	7	8	(a)	—	—
Texas U of							
Arlington	7	19	2	—	—	—	—
Austin	52	0	12	20	107	23	3
Dallas	7	0	13	—	—	—	—
El Paso	8	0	5	—	—	—	—
Texas Woman's U	0	3	3	1	—	—	—
Thiel C	2	8	—	—	—	—	—
Thomas More C	4	3	—	—	—	—	—
Toledo, U of	1	17	3	0	24	9	2
Towson State U	11	3	—	—	—	—	—
Trenton State C	10	0	—	—	—	—	—
Trinity C	11	15	0	—	—		
Trinity U	0	6	0	—	—		
Tri-State U[c]					(a)	—	—
Tufts U	0	48	4	1	37	11	2
Tulane U of Louisiana	3	10	1	1	(a)	—	—

	CHEMISTRY				CHEMICAL ENGINEERING		
	Bachelor's, certified						
	Yes	No	M.S.	Ph.D.	B.S.	M.S.	Ph.D.
Tulsa, U of	2	0	—	—	25	4	3
Tuskegee Institute	0	9	2	—	—	—	—
Union C	2	15	0	—	—	—	—
U.S. Air Force Academy	8	4	—	—	—	—	—
U.S. Naval Academy	30	0	—	—	—	—	—
Ursinus C	4	16	—	—	—	—	—
Utah State U	5	0	3	1	—	—	—
Utah, U of	3	33	6	14	(a)	—	—
Valparaiso U	4	48	—	—			
Vanderbilt U	1	33	2	6	40	0	0
Vassar C	0	7	0	—	—	—	—
Vermont, U of	22	0	2	4	—	—	—
Villanova U	12	0	4	2	38	3	—
Virginia Commonwealth U	8	21	1	2	—	—	—
Virginia Military Institute	10	0	—	—	—	—	—
Virginia Polytechnic Institute & State U	9	15	10	15	85	0	2
Virginia, U of	6	57	5	10	33	20	2
Wabash C	8	13	—	—	—	—	—
Wagner C	3	8	—	—	—	—	—
Wake Forest U	5	15	2	0	—	—	—
Washburn U of Topeka	3	4	—	—	—	—	—
Washington C	6	1	—	—	—	—	—
Washington and Jefferson C	0	28	—	—	—	—	—
Washington and Lee U	0	13	—	—	—	—	—
Washington State U	10	6	6	6	24	6	1
Washington U	0	21	6	8	52	12	0
Washington, U of	52	21	9	21	74	14	2
Wayne State U	22	19	14	4	33	18	1
Waynesburg C	6	1	—	—	—	—	—
Weber State C	5	5	—	—	—	—	—
Wellesley C	2	12	—	—	—	—	—
Wesleyan U	1	16	3	2	—	—	—
West Chester State C	9	13	2	—	—	—	—
West Florida, U of	7	3	—	—	—	—	—
West Texas State U	0	9	1	—	—	—	—
West Virginia Institute of Tech	0	1	—	—	17	0	—
West Virginia State C	2	5	—	—	—	—	—
West Virginia U	10	42	1	3	47	8	1
Western Illinois U	9	6	0	—	—	—	—
Western Kentucky U	5	16	4	—	—	—	—
Western Maryland C	3	6	—	—	—	—	—
Western Michigan U	7	25	2	1	—	—	—
Western New England C	0	3	—	—	—	—	—
Western Washington U	5	10	0	—	—	—	—
Westminster C	1	2	—	—	—	—	—
Wheaton C (Illinois)	5	8	—	—	—	—	—
Wheaton C (Massachusetts)	1	4	—	—	—	—	—
Wheeling C	0	1	—	—	—	—	—
Whitman C	2	10	—	—	—	—	—
Whittier C	1	2	—	—	—	—	—
Wichita State U	6	1	4	1	—	—	—
Widener U	5	3	—	—	—	—	—
Wilkes C	14	5	—	—	—	—	—
Willamette U	3	8	—	—	—	—	—
William and Mary, C of	20	9	2	—	—	—	—
William Paterson C of New Jersey	0	7	—	—	—	—	—
Williams C	0	30	—	—	—	—	—
Wisconsin, U of							
Eau Claire	3	9	—	—	—	—	—
Green Bay	0	6	—	—	—	—	—
La Crosse	4	10	—	—	—	—	—
Madison	8	18	13	28	96	4	8
Milwaukee	9	13	12	2	—	—	—
Oshkosh	2	9	0	—	—	—	—
Parkside	5	6	—	—	—	—	—
Platteville	1	7	—	—	—	—	—
River Falls	10	9	—	—	—	—	—
Stevens Point	1	6	—	—	—	—	—
Superior	0	3	—	—	—	—	—
Wittenberg U	1	11	—	—	—	—	—
Wooster, C of	4	18	—	—	—	—	—
Worcester Polytechnic Institute	6	8	3	2	40	9	1
Wright State U	18	17	7	—	18	7	0
Wyoming, U of	3	0	1	1	18	7	0
Xavier U (Ohio)	6	14	4	—	—	—	—
Xavier U of Louisiana	4	13	—	—	—	—	—
Yale U	23	2	41	16	—	—	—
Youngstown State U	6	25	6	1	25	—	—
TOTALS	**4337**	**6116**	**1609**	**1613**	**583**	**1102**	**250**

a Data not submitted. b Added in 1981. c Listed on basis of accreditation by AIChE-ABET. d The chemistry programs at Mount Saint Vincent College and Manhattan College are integrated into a combined department with all instruction in chemistry located at Manhattan College. e Master's degrees given by Atlanta University. **Note:** For brevity, "B.S." and "M.S." are used to denote all bachelor's and master's degrees, respectively, in each column.

Travel grants available for summer meetings

The Organometallic Subdivision of the ACS Division of Inorganic Chemistry expects to have available a limited number of travel grants for individuals planning to attend the 3rd International Symposium on Homogeneous Catalysis (ISHC) to be held in Milan, Italy, Aug. 30–Sept. 3. Funds for the grants will be given by the National Science Foundation and will be limited to advanced payment excursion fare from the point of departure to Milan.

In the event funds are granted, the subdivision would like to be able to inform successful applicants at the earliest possible time. If you are interested in being considered for a travel stipend, write to: ISHC Selection Committee, c/o J. E. Bercaw, Department of Chemistry, California Institute of Technology, Pasadena, Calif. 91125. Completed applications must be postmarked no later than May 1. Preference will be given to active investigators who intend to present significant new results; if you have made such plans please append a copy of your abstract to your application. Travel stipends from NSF require use of U.S. flag carriers.

The National Science Foundation has made available a limited number of travel grants to support individuals planning to attend the 4th International Conference on Organic Synthesis to be held in Tokyo, Japan, Aug. 22–27, 1982. Those interested in applying for international travel support should contact Prof. Conrad J. Kowalski, Department of Chemistry, University of Notre Dame, Notre Dame, Ind. 46556, Tel. (219) 239-5911. Completed applications must be received no later than May 14. Travel stipends are limited to the cost of airline tickets and require the use of U.S. flag carriers.

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Scripps Institute of Oceanography

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